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Mineralogical Magazine a more valuable journal than it has been heretofore. Several of the articles in that journal have been more notable for quantity than quality. Like the other English societies the Mineralogical Society has gravitated to London, although originally intended as a peripatetic society.—Native lead has been observed in cavities in red carbonate of lead from Maulmain, Burma, India. It occurs in small masses associated with minute crystals of white cerussite. The bright red color of the cerussite containing the native lead is probably due to an intimate mixture of minium.—H. A. Miers, of the British Museum, has measured with a Fuess goniometer several crystals of the rare mineral *meneghinite*. It occurs in slender needles, and the end planes are very small. The needles are deeply striated or channeled, making measurements difficult. A number of new faces were observed, and the crystals determined to be *orthorhombic*, with the axial lengths $a : b : c = 1.89046 : 1 : .68664$.—Associated with galena, and filling cavities in quartz, an interesting form of *kaolinite* occurs in Ouray county, Colorado. The mineral appears as a mass of glistening white scales visible to the naked eye, and under the microscope show as perfect transparent crystals having well-defined pyramidal planes.—Dr. M. E. Wadsworth has issued a descriptive catalogue of one hundred thin sections of American and foreign rocks for the use of students of microscopical lithology. The collection consists of European rocks described by Rosenbusch, Zirkel and several other European lithologists, together with a number of American rocks described by Dr. Wadsworth. This appears to be the most complete and systematic collection for students that has yet been arranged.

BOTANY.¹

THE FERTILIZATION OF GIANT HYSSOP (*LOPHANTHUS NEPE-TOIDES*).—The giant hyssop has greenish-yellow flowers about one centimeter long. The inner stamens are the longest and are the first to appear on the opening of the bud (Fig. 1). While the outer or shorter pair of anthers develop and take a position

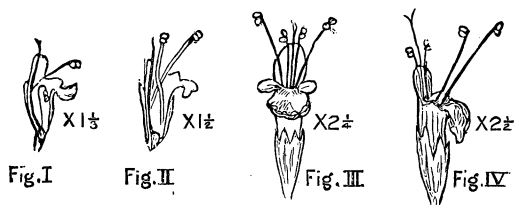


FIG. 1.—Section of opening flower. FIG. 2.—Section of open flower. FIG. 3.—The same, front view. FIG. 4.—Side view of flower with the stigma-lobes mature.

close to the upper lip, the inner or longer stamens move forwards so that the filaments of the two sets cross each other (Fig. 2). The inner stamens therefore are near the lower lip of the corolla

¹ Edited by PROF. C. E. BESSEY, Ames, Iowa.

and diverge considerably, while the outer pair stand erect and close together near the upper lip (Fig. 3). During this time the stigma lobes are closed and the style has grown to the length of the longest stamens and assumed a position almost erect, inclined rather to the back of the flower (Fig. 4). The flowers are therefore proterandrous, but not purely so. In the bud all the stamens and the style curve forwards under the lower lip.

The distinguishing feature between this and the ordinary Labiatae consists in the crossing of the filaments, by means of which the longer inner stamens take the appearance of being the outer stamens, and in the curvature of the style. The style of the Labiatae usually bends forwards at maturity, so as to meet the body of the visiting insects. In this species it seems to bend backwards, often much more than represented in Fig. 4. In truth, however, this bending occurs before maturity, and either remains so at the time the stigma matures, or the curvature forwards is rather slight, leaving it behind a line vertical to the individual flowers.

The visiting insect begins at the lower part of the interrupted spikes, receiving pollen on its sides from the longer stamens, and under its body as it crawls over the smaller ones to the next flower, at the same time leaving pollen on the stigma lobes. The flower has accommodated itself to the crawling habit of its visitor.

To explain more fully, the flowers of most Labiatae are so arranged as to necessitate the entrance of the insect from one particular position, compelling them generally to leave the plant each time and thus fly to the individual blossoms it chooses to visit. Hence the curvature of the style forwards is adapted to touch the insect in one particular spot each time. In the case of *Lophanthus* the flowers generally are blossoming throughout the whole length of the spike at the same time, and from the shortness of the tube and lips of the flowers the bees readily crawl from one flower to the next in a rather indefinite fashion. The backward curvature is here the best adapted to the circumstances since it does not offer any unnecessary resistance to the body of the insect. Still the arrangement of the flower must be considered as of a low degree of specialization.—*Aug. F. Foerste, Granville, Ohio.*

THE INJURIOUSNESS OF PORCUPINE GRASS.—Our inquiry as to whether porcupine grass has ever been known to injure domestic animals in this country is answered as follows by Dr. M. Stalker, the State veterinarian of Iowa :

You ask whether the fruits of porcupine grass (*Stipa spartea*) are ever a source of inconvenience or injury to living animals? This may be very emphatically answered in the affirmative. In many of the north-western counties of Iowa this grass grows in

the greatest profusion, and during the latter part of June, the season for maturing and consequent falling of these spines. they are the occasion of much annoyance and in some instances the death of domestic animals. Only such animals as are covered with wool or a thick growth of long hair are seriously inconvenienced. Sheep suffer most. The spines readily find a lodgment in the wool, and after burrowing through it frequently penetrate the skin and bury themselves in the flesh. A large number of these barbs thus entering the tissues of the body produce an amount of irritation that is sometimes followed by death. I have seen large numbers of these imbedded in the skin and muscular tissues of shepherd dogs that were covered by a thick growth of soft hair. These sagacious animals frequently exhibit the greatest dread at being sent into the grass during the season of danger."

STRUCTURE OF THE FRUIT OF PORCUPINE GRASS.—The mature "fruit" of this interesting grass consists of a narrow cylindrical grain (Fig. 3) about 1^{cm} long and 1^{mm} thick. This is enclosed in

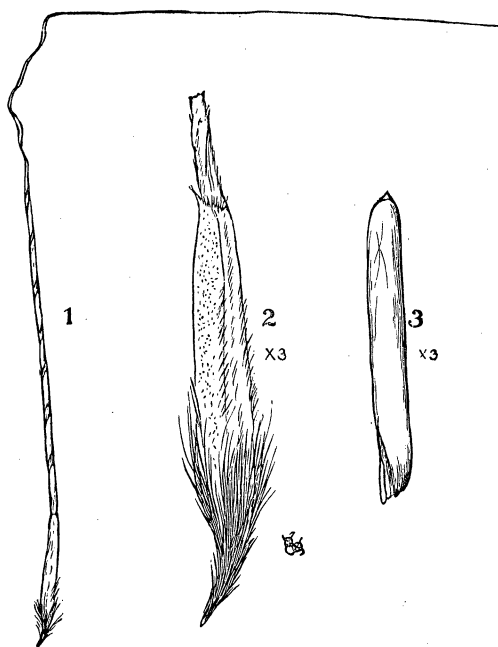


FIG. 1.—Entire "fruit" of porcupine grass, natural size, showing the twisted awn. FIG. 2.—Lower portion of the same, enlarged. FIG. 3.—Grain of same, enlarged.

the two hard persistent palets, the larger of which bears a tough awn from 12 to 16^{cm} long (Fig. 1). This larger palet completely encloses the smaller one, and at maturity it is quite difficult, with

the naked eye, to make out its overlapping margins. Its lower portion is densely covered with stiff hairs (Fig. 2), as is also the short pedicel upon which the whole flower rests. This pedicel is tapering, curved and greatly indurated, and at the maturity of the fruit it separates at its lower end from the rest of the axis. At its point of separation, which now becomes the lower end of the "fruit," it is very sharp, readily piercing clothing or even the skin of the back of one's hand. The hairs prevent the withdrawal of the point, and tend to cause it to enter more deeply.

The awn, which is at first straight, is channeled on two nearly opposite sides. Both the channels, as well as the general surface of the awn, are provided with short stiff hairs which act as barbs. At maturity the awns begin twisting throughout a little more than their lower half as shown in Fig. 1, but the upper portion remains straight or nearly so, and soon becomes bent at nearly a right angle to the twisted part. This twisting facilitates the entrance of the barbed pedicel and palets into the soil, and, as lately pointed out, into the skins of sheep, dogs and other domestic animals. The greater weight of the lower end of the whole "fruit" makes it, before the twisting of the awn, an excellent dart, and on falling out of the glumes it invariably strikes point downwards.—*C. E. Bessey*.

AN ABNORMAL FUCHSIA BLOSSOM.—I have lately had an opportunity of examining an abnormality of the calyx of a fuchsia, which seems to allow of certain important deductions.

It consists of the partial modification of one of the sepals into a foliage-leaf. A distinct midrib extends up the center of the sepal, which, on one side, is of the color and structure usual in the sepals of the fuchsia, while the other half is exactly similar to the half of a foliage-leaf of the same plant, presenting a green color, the toothed margin and the ordinary venation, being also the same width as half a foliage-leaf, and thus much broader than the portion on the other side of the midrib. Accompanying this modification there is a partial separation of the sepal from the calyx-tube. The unmodified half is adherent to the adjacent sepal, the leaf half only being separated and modified so as to represent below a leaf-petiole. This separation extends down to the base of the calyx-tube, and even to the base of the green receptacle below this.

Abnormalities similar to this seem to be of not uncommon occurrence. Among others Arndt (Botan. Jahresb., 1878) describes a case in which the limbs of the calyx were some half, others altogether green, the margins being toothed; Liebe (Botan. Jahresb., 1880) one in which the sepals were transformed into long petioled foliage-leaves; and Buchenan (Botan. Jahresb., 1880) besides stating a case that came under his own observation, in which two of the sepals had become transformed into foliage-

leaves, springing apparently from the base of the receptacle, and having in their axils each a stamen, cites a case observed by Suringar in which one sepal with the two stamens opposite it became separated from the flower in a similar manner, and also one observed by Magnus in which all the sepals were transformed into foliage-leaves and separated as far down as the base of the receptacle, similar, accordingly, to the condition observed by Liebe.

Besides supporting the now universally accepted theory of the foliar nature of the sepals, the above instances and the one I have observed strengthen a supposition made by Magnus (*Botan. Jahresb.*, 1879) after a study of two monstrous orchids, that in this order, as well as in the fuchsia, the green enlargement found below the floral leaves is not formed by the hollowing out of the axis, nor yet of carpellary leaves enclosed by an enlargement of the axis, but is an organ of a foliar nature. In other words, in the case of the fuchsia the dilatation is formed by the union of the bases of the petioles of the calycine leaves with each other and with the ovary, and therefore consists of two portions—in the interior the ovary and on the exterior the coalesced petioles. The term *receptacle* applied to it above is accordingly not correct, but was employed for convenience.

Another point indicated is, that the calyx-tube is *not* formed by the coalescence of those parts of the sepals which correspond to the petioles of foliage-leaves, the limbs representing the lamina, but consists partly of both petioles and laminae. This was very evident in the case I examined, where the abnormal part was half sepal and half foliage-leaf, and therefore permitted a direct comparison. How far this may hold good in other cases in which the calyx (or even the corolla, as in the Primulaceæ and Caryophyllaceæ, for instance) is composed of a well marked tube and limbs, or parts corresponding to them, I have not had opportunity to determine.—*J. Playfair McMurrich, Guelph, Canada.*

BOTANICAL NOTES.—The June *Torrey Bulletin* contains, among other articles of interest, one on the may-apple, by Aug. F. Foerste, devoted mainly to structure and development. Some odd abnormalities are figured. Many of these, however, were figured and described by Professor T. C. Porter in the *Botanical Gazette*, in 1877 (Vol. II, No. 9). In this connection we may record the fact, that in Central Iowa this year many colonies of may-apples were found with distinctly *pink* flowers.—The Table Alphabétique of Henri Van Heurck's *Synopsis des Diatomées de Belgique* has just been received by American subscribers.—Fascicles I and II of Luerissen's "*Farnpflanzen oder Gefassbündelkryptogamen*" (being parts of the third volume of the new edition of Rabenhorst's *Kryptogamen-Flora*) has lately appeared. It promises to be a work of great interest to pteridologists.—

Oberlin College is fortunate in coming into the possession of the extensive collection of plants made by Dr. Beardslee, of Painesville, Ohio.—In an important paper read before the American Philosophical Society, Oct., 1883, and printed May 12, 1884, John C. Branner discusses the course and growth of the fibro-vascular bundles in palms. He reviews at length the various theories which have been held as to the course of the bundles in the palms, a subject well known to be surrounded by many difficulties. The discussion is based upon direct personal observations and study of a large number of specimens of no less than seventeen different genera.—The long looked-for Manual of Mosses, by Lesquereux and James, has at last been issued by Cassino & Co., of Boston. An adequate notice will appear soon.—Wm. Boott describes several new sedges in the June *Bot. Gazette*.—In the same number the announcement appears that Professors Coulter and Barnes are engaged in a special study of the North American species of the genus *Cyperus*, and desire to receive specimens. "Loaned specimens will be retained for as short a time as possible, and carefully returned."—The "Questions on botany," prepared by Professor Spalding for the use of students who have attended the general lectures on botany delivered in the departments of pharmacy and medicine in the University of Michigan, indicate that in another of our medical schools the importance of biological botany is fully realized.—Mr. R. M. Christy read a paper recently before the Linnean Society of London on the power of penetrating the skins of animals possessed by the seed of *Stipa spartea*. "Inquiry among butchers and others showed conclusively that large numbers [of these seeds] were often found beneath the skin of sheep, especially about the shoulders." This grass is abundant in the Mississippi valley (where it is known as Porcupine grass), and we have been familiar with it for years, but have never before heard of its penetrating the skins of animals. Has this been noticed by NATURALIST readers?

ENTOMOLOGY.

LIFE-HISTORIES OF SOME GEOMETRID MOTHS.—These and other unpublished notes on Lepidopterous larvæ have been prepared in connection with work on our forest trees done for the Entomological division of the U. S. Department of Agriculture, and to be incorporated in the fifth report of the U. S. Entomological Commission.

Aplodes coniferaria, n. sp.—We have reared six moths from curious 14-flapped larvæ found feeding in August on the fir and hemlock, and described in Bulletin VII, U. S. Ent. Comm., p. 238, and referred by us to *Aplodes*. The caterpillar is dull brick-red, with seven pairs of broad dorsally situated flat flaps on each side. It bears a striking resemblance to the small reddish twigs of the fir with the leaf scars.